

## Claims

1. Method for controlling the transition from a first mode of operation, of an internal combustion engine (16) with fuel  
5 direct injection, to a second mode of operation, for example between a homogeneous stoichiometric and a homogeneous lean stratified or HCCI mode (homogeneous charged compression ignition), switchovers of the valve lift or the valve phase, whereby the torque is determined  
10 before and after the switchover and any impermissible step-change in the torque is partially compensated by a resetting of the ignition angle, characterized in that for the purpose of further compensating for the impermissible step-change in torque a split injection of fuel is  
15 effected, whereby at least a portion of the fuel load to be injected is injected during the compression phase.
2. Method in accordance with claim 1, characterized in that during the switchover phase the fuel load to be injected  
20 is injected entirely within the compression phase.
3. Method in accordance with one of the preceding claims, characterized in that the portion of the fuel load which is to be injected is fed in in the phase when at least one  
25 inlet valve is closed.
4. Method in accordance with one of the preceding claims characterized in that the ignition angle is continuously retarded.  
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5. Method in accordance with one of the preceding claims characterized in that after the switchover there is a return to normal operation if the torque smoothing has been successfully completed.  
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6. Method in accordance with one of the preceding claims characterized in that a larger valve lift can be specified in the case of a discrete valve lift switchover.
- 5 7. Method in accordance with one of the preceding claims characterized in that for the purpose of switching over to a small valve lift the throttle valve is first opened before switching over to the small valve lift, that the ignition angle is retarded back to a permissible minimum value and that split injection is activated in the  
10 compression phase.
8. Method in accordance with one of the preceding claims characterized in that after a switchover to operation with  
15 a small valve lift or a large valve lift the settings for the corresponding standard injection are then applied.
9. Device for controlling the transition between two modes of operation in accordance with one of the preceding claims,  
20 with a control unit (11), with a memory (12) and with a program which is designed for switching over from the first mode of operation to the second mode of operation, characterized in that the program has an algorithm which, for the purpose of compensating for a step-change in the  
25 torque before and after the switchover, can be used to reset first the air mass and then the ignition angle, and that when a minimum value is reached for the ignition angle the fuel can be injected into the cylinder during the compression phase in the form of one portion of a  
30 split injection.
10. Device in accordance with claim 9 characterized in that the fuel can be fed in by an injection entirely within the compression phase.